UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,320	08/26/2003	Hossein Najaf-Zadeh	18-47 US	2019

25319 7590 01/28/2008

FREEDMAN & ASSOCIATES
117 CENTREPOINTE DRIVE
SUITE 350
NEPEAN, ONTARIO, K2G 5X3
CANADA

EXAMINER	
KURR, JASON RICHARD	
ART UNIT	**PAPER NUMBER**
2615	

MAIL DATE	DELIVERY MODE
01/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/647,320	NAJAF-ZADEH ET AL.	
	Examiner	Art Unit	
	Jason R. Kurr	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-22 and 31-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *36-39* is/are allowed.

6)☒ Claim(s) *13,22,31-35 and 40-43* is/are rejected.

7)☒ Claim(s) *14-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 November 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 42 is objected to because of the following informalities:

Claim 42 recites the limitation "the MPEG-1 psychoacoustic model 2" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 13, 22, 31-32, 40 and 43 are rejected under 35 U.S.C. 102(e) as being anticipated by Lockwood et al (US 6,477,489 B1).

With respect to claim 13, Lockwood discloses a method for encoding an audio signal comprising: receiving the audio signal (fig.1 “s”); determining an inharmonicity index in dependence upon the received audio signal (col.8 ln.52-55 “Sn,f^2”); determining a masking threshold in dependence upon the inharmonicity index using a

psychoacoustic model (fig.1 #60, col.8 ln.56-59); and, encoding the audio signal in dependence upon the masking threshold (fig.1 #64, col.10 ln.15-21).

With respect to claim 22, Lockwood discloses a method for encoding an audio signal as defined in claim 13, comprising: determining a temporal masking index in dependence upon the received audio signal (col.6 ln.33-67, col.7 ln.1-26); and, determining a masking threshold in dependence upon the inharmonicity index and the temporal masking index using a psychoacoustic model (col.8 ln.56-59).

With respect to claim 31, Lockwood discloses a method for encoding an audio signal comprising: receiving the audio signal (fig.1 "s"); determining a masking index in dependence upon human perception of natural characteristics of the audio signal by considering at least a wideband frequency spectrum of the audio signal (col.8 ln.52-55); determining a masking threshold in dependence upon the masking index using a psychoacoustic model (fig.1 #60, col.8 ln.56-59); and, encoding the audio signal in dependence upon the masking threshold (fig.1 #64, col.10 ln.15-21).

With respect to claim 32, Lockwood discloses a method for encoding an audio signal as defined in claim 31, wherein the wideband frequency spectrum is the complete frequency spectrum of the audio signal (col.3 ln.62-67, col.4 ln.1-10).

With respect to claim 40, Lockwood discloses a method comprising: receiving an audio signal (fig.1 "s"); determining an inharmonicity index in dependence upon the received audio signal (col.8 ln.52-55 "Sn,f^2"); using the inharmonicity index adjusting a psychoacoustic model; determining a masking threshold using the adjusted

psychoacoustic model (fig.1 #60, col.8 ln.56-59); and, processing the audio signal in dependence upon the masking threshold (fig.1 #64, col.10 ln.15-21).

With respect to claim 43, Lockwood discloses a method for encoding an audio signal as defined in claim 40, comprising: determining a temporal masking index in dependence upon the received audio signal (col.6 ln.33-67, col.7 ln.1-26); and, adjusting the psychoacoustic model in dependence using the inharmonicity index and the temporal masking index (col.8 ln.56-59).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 33-35 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lockwood et al (US 6,477,489 B1).

With respect to claims 33, 41 and 42 Lockwood discloses a method for encoding an audio signal as defined in claims 31 and 40 respectively, however does not disclose expressly wherein the psychoacoustic model is the MPEG-1 psychoacoustic model 2. Official Notice is taken that the MPEG-1 psychoacoustic model 2 is well known in the art and at the time of the invention it would have been obvious to a person of ordinary skill in the art to use the MPEG-1 psychoacoustic model 2 as the psychoacoustic model

discloses by Lockwood. The motivation for doing so would have been to make the noise masking system of Lockwood compatible with the pre-existing format. This would allow the system to be used with the already prevalent MPEG encoding standard.

With respect to claim 34, Lockwood discloses a method for encoding an audio signal as defined in claim 33, wherein the non-linear masking index is a temporal masking index (col.6 ln.33-67, col.7 ln.1-26).

With respect to claim 35, Lockwood discloses a method for encoding an audio signal as defined in claim 33, wherein the non-linear masking index is an inharmonicity index (col.8 ln.56-59).

Allowable Subject Matter

Claims 14-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 36-39 are allowed.

Response to Arguments

Applicant's arguments filed November 1, 2007 have been fully considered but they are not persuasive.

With respect to claims 13 and 22, the Applicant argues that Lockwood does not teach "determining an inharmonicity index in dependence upon the received audio signal". The Examiner would like to note the that the process by which an inharmonicity

index is determined is not defined by the claim, thus it is impossible to exclude any parameter determined by Lockwood as not qualifying as an inharmonicity index as long as the parameter is relied upon to determine a masking threshold as defined by the claim. Lockwood discloses in column 8 lines 52-59, wherein a masking curve is computed using the signal "Sn,f^2" which has been previously cited by the Examiner as being the "inharmonicity index". Thus the disclosure of Lockwood supports the claim limitations as defined by the claims. The same can be said for the limitations of claim 22, wherein a "temporal masking index" is not defined by the claim, except that it is used to determine the masking threshold. The Examiner has cited the overestimator Bn,i, which is used in the calculation of the frequency response Hn,f^2 which in turn is used to compute the masking curve, thus satisfying the limitations of the claim language.

With respect to claims 31 and 32 the Applicant argues that the present invention defines a method for determining a masking threshold based on at least a wideband frequency spectrum, wherein the frequency spectrum is the complete frequency spectrum of the audio signal, which is in contrast to the J.D. Johnston model implemented by the disclosure of Lockwood. The Examiner would like to note, that such a limitation is open ended, and does not limit the range of the disclosed frequency spectrum because all audio signals are not standard. For example; if an audio signal of a single frequency within the acceptable range of the J.D. Johnston model is processed by the J.D. Johnston model, then all of the limitations of claims 31 and 32 are met

because the processed frequency spectrum would be the complete frequency of the audio signal.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK
JK

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600